Unit 06: Variables, Tables, & Graphs

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **3 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will develop the ability to recognize, describe and analyze the relationship between two variables. They will learn to identify the independent and dependent variables in real world situations as well as describe patterns of change in words, data tables, graphs, and equations.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives:

- Construct a graph from a data table
- Construct a data table from a graph
- Define and identify independent and dependent variables
- Examine patterns of change in a data table, graph, and equation
- Calculate average speed
- Translate between written phrases and algebraic expressions
- Write one and two-step equations to model real-world mathematical problems

Essential Questions:

- Which variables depend on or change in relation to others?
- How can you use a table, graph, or equation to represent and analyze a relationship between variables?

Essential Understandings:

- Linear patterns can be found in tables and graphs of numerical data and those patterns can be expressed in words and in symbolic equations or formulas.
- Information given in tables, graphs, and symbolic expressions can be used to solve problems and make decisions about linear relationships.

CONTENT AREA STANDARDS

6.RP

A. Understand ratio concepts and use ratio reasoning to solve problems

6.NS

A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions

B. Compute fluently with multi-digit numbers & find common factors & multiples

C. Apply and extend previous understandings of numbers to the system of rational numbers

6.EE

A. Apply and extend previous understandings of arithmetic to algebraic expressions

B. Reason about and solve one-variable equations and inequalities

C. Represent and analyze quantitative relationships between dependent and independent variables

6.SP

A. Develop understanding of statistical variability

B. Summarize and describe distributions

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.6.RP.A.3a	Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.6.NS.C.6b	Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
MA.6.NS.C.6c	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
MA.6.NS.C.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
MA.6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
MA.6.EE.C.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent

variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

9.1.8.RM.1: Determine criteria for deciding the amount of insurance protection needed. • 9.1.8.RM.2: Analyze the need for and value of different types of insurance and the impact of deductibles in protecting assets against loss

LA.K-12.NJSLSA.R10	Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
CS.K-12.3	Recognizing and Defining Computational Problems
CS.K-12.3.a	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CS.K-12.3.b	Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CS.K-12.3.c	Evaluate whether it is appropriate and feasible to solve a problem computationally.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- Content-specific vocabulary: average speed, independent variable, dependent variable, equation, income, profit, rate of change
- How to identify independent and dependent variables.
- How to identify the difference between linear versus nonlinear patterns.
- How to calculate average speed from a data table and graph.

Procedural Knowledge

Students will be able to:

- Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.
- Analyze the relationship between the dependent and independent variables using graphs and tables, and relate them to the equation.
- Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.
- Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all non-negative rational numbers.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

- Observations
- Classwork
- Homework Assignments
- Do Now Questions
- Exit Tickets
- Self Assessment Questions
- Proficiency Scale

Summative Assessments

- Quizzes

- Unit Assessments

- Graded Assignments

- Projects

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Variables & Patterns (Investigations 1-2)*
- Savvas Realize (teacher and student resources)
- Additional Resources linked HERE

- Math 6 Enriched Variables & Patterns folder linked [HERE](#)
- [Khan Academy](#)
- [Delta Math](#)
- Illustrative Math Performance Tasks:
    - [6.EE.C.9 Chocolate Bar Sales](#)

- [IXL - Recommended](#) Skills Practice
    - BB.2 Identify Independent and Dependent Variables in Tables and Graphs
    - BB.3 Write an Equation from a Graph using a Table
    - BB.11 Identify the Graph of an Equation
    - BB.12 Complete a Table and Graph of a Two-Variable Equation
    - BB.14 Interpret a Graph: Word Problems

INTERDISCIPLINARY CONNECTIONS

- Computations
- Financial/Economic/Business/Entrepreneurial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.